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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte ANDREA GIRALDO, MARK THOMAS JOHNSON,
WILLIAM PETER MECHTILDIS JANS, and REMCO LOS

———

Appeal 2009-004865
Application 10/551,023
Technology Center 2600

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Decided: December 31, 2009

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Before ROBERT E. NAPPI, CARLA M. KRIVAK, and
KARL D. EASTHOM, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal (App. Br. 4)[1] under 35 U.S.C. § 134(a) from the Final Rejection of claims 1-14. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellants' disclosed invention applies a pulse width modulation (PWM) scheme to a display device having a plurality of light emitting elements. The scheme involves applying at least first and second non-zero emission levels during different time intervals in a frame. (Abstract.) According to the claims, the scheme generates time intervals, including first and second time intervals in an order that reduces dead times between the time intervals. Exemplary claim 1 follows:

1. A display device comprising:

a display with a plurality of light emitting elements, and data lines for providing pulse width modulation signals to the light emitting elements; and

means coupled to the data lines for generating, during time intervals of a frame period, at least a first non-zero emission level of a light emitting element during a first one of the time intervals and a second non-zero emission level during a second one of the time intervals, wherein the generating means generates the first and second time intervals in an order that reduces dead times between the time intervals.

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[1] This opinion refers to Appellants' Brief [hereinafter "App. Br."] and Reply Brief [hereinafter "Reply Br."], and the Examiner's Answer [hereinafter "Ans."].

The Examiner relies on the following prior art references:

Pooley	US 4,771,278	Sept. 13, 1988
Khormaei	US 5,652,600	July 29, 1997
Rushing	US 6,567,171	May 20, 2003

The Examiner rejected:

Claims 1-5 and 9-14 as obvious under 35 U.S.C. § 103(a) based on Khormaei and Applicants' Admitted Prior Art [hereinafter the "AAPA"]

Claims 6 and 7 as obvious under 35 U.S.C. § 103(a) based on Khormaei, AAPA, and Rushing; and

Claim 8 as obvious under 35 U.S.C. § 103(a) based on Khormaei, AAPA, and Pooley.

ISSUES

Appellants contend (App. Br. 13-20) that Khormaei and the AAPA collectively do not teach at least first and second non-zero emission levels of a light emitting element respectively during first and second time intervals, and generating the first and second time intervals in an order that reduces dead times between the time intervals, as required by independent claims 1, 11, and 12. Appellants primarily focus on claim 1 with arguments pertaining to claims 11 and 12 tracking those for claim 1. Accordingly, claim 1 is selected as representative of the claims rejected by Khormaei and AAPA. *In re Nielson*, 816 F.2d 1567, 1572 (Fed. Cir. 1987); 37 C.F.R. § 41.37(c)(1)(vii). Appellants' arguments present the following issue: Did Appellants demonstrate that Khormaei and AAPA collectively teach time intervals, generating at least first and second non-zero emission levels of a

light emitting element respectively during a first and second one of the time intervals, and generating the first and second time intervals in an order that reduces dead times between the time intervals, as required by independent claim 1?

FINDINGS OF FACT (FF)

Khormaei

1. Khormaei states: "Furthermore, the luminescence can also be controlled by varying the shape of the voltage pulses (FIG. 10), the pulse width (FIG. 11), the pulse frequency (FIG. 12), the pulse amplitude (FIG. 13), or other gray scale techniques." (Col. 8, ll. 1-4.) The additional techniques "adjust the pixel luminescence within different subframes of differing time durations." (*Id.* at ll. 5-8)

2. Figures 10, 11, 13, and 14 disclose at two least two different non-zero pulse widths. Khromaei discloses at least 32 grey level states for the scheme of Figure 14 by employing, *inter alia*, varying lengths of pulsewidths (and amplitudes). (Col. 8, ll. 15-37.)

Appellants' Disclosure

3. Appellants describe AAPA Figure 4 (Spec. 4: 16-17) as follows:

> Fig. 4 displays a timing diagram employing multiline row addressing (MLA) in combination with PWM. *As can be clearly observed, in MLA the amount of dead times between the time intervals SF and for the rows 4 is variable and can be minimized by applying proper algorithms.* As a result the available time in the frame period is used more efficiently. It is noted that it may be preferred to shuffle or mix up the time intervals within the frame period in order to obtain the most efficient result. This means that in the example of the previous paragraph the sequence of time intervals is not necessarily SF1,

SF2, SF3, SF4, SF5, SFA[sic]6, but e.g. SF3, SF1, SF6, SF4,
SF2, SF5.
(Spec. 5: 31 to 6:4 (emphasis added); 4:16-17.)
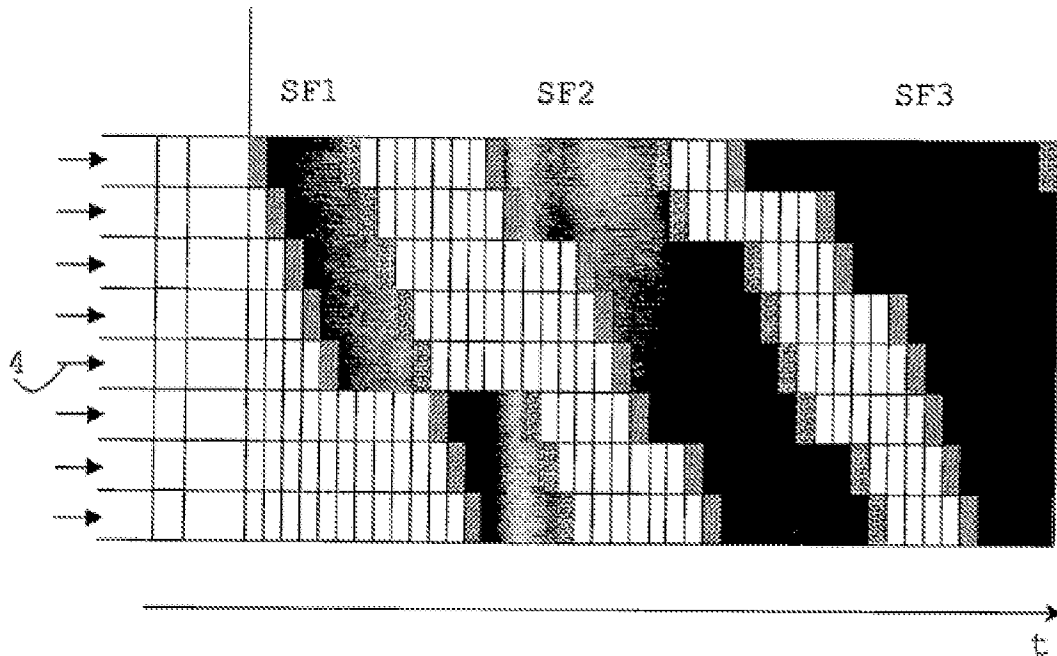
4. Appellants' Figure 4 is reproduced below:

FIG.4

Appellants' AAPA Figure 4 depicts varying dead times as represented
by the varying numbers of white blocks between the subfields (time
intervals) SF1, SF2, and SF3. (Spec. 5: 23-24; FF 3.)

5. Appellants also describe Figure 3 as prior art. In Figure 3, all the
rows show dead times as a constant of seven white blocks between SF1 and
SF2. (Spec. 4:14-15.)

PRINCIPLES OF LAW

"[T]he examiner bears the initial burden, on review of the prior art or
on any other ground, of presenting a *prima facie* case of unpatentability." *In*

re Oetiker, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Appellants have the burden on appeal to show reversible error by the Examiner in maintaining the rejection. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (citation omitted).

Under § 103, a holding of obviousness can be based on a showing that "there was an apparent reason to combine the known elements in the fashion claimed." *KSR Int'l Co., v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

"Absent an express definition in their specification, the fact that appellants can point to definitions or usages that conform to their interpretation does not make the PTO's definition unreasonable when the PTO can point to other sources that support its interpretation." *In re Morris*, 127 F.3d 1048, 1056 (Fed. Cir. 1997). "The appellants urge us to consult the specification . . . and interpret the disputed language more narrowly in view thereof. . . . Such an approach puts the burden in the wrong place. It is the applicants' burden to precisely define the invention, not the PTO's." *Id.*

ANALYSIS

Appellants contend (App. Br. 18-19) that "Claims 1, 11 and 12 substantially recite 'at least a first non-zero emission level . . . and a second non-zero emission level' in which case 'n' is at least 'two' and the grey scale levels therefore are enhanced by a factor of '2' instead of only '1' (namely, no enhancement) as taught by Khormaei and AAPA." This argument lacks

merit and fails to address the Examiner's finding (Ans. 4-5, 11) that column 8 and Figures 10-13 of Khormaei satisfy the first and second non-zero emission levels of the independent claims. Khormaei and AAPA each teach PWM. PWM involves at least two (or more) grey scale and/or emission levels. (FF 1-3.) As the Examiner reasoned (Ans. 12), Appellants' arguments directed to "n" "enhancement[s]" are not clearly commensurate in scope with claim 1. Moreover, even if "n" "enhancements[s]" designate the number of grey scale levels of at least 2 (corresponding to the number of non-zero emission levels), the prior art PWM teachings satisfy that limitation for the reasons discussed above.

Appellants also argue (App. Br. 19) that the AAPA does not teach "an order that reduces dead times," as called for in claim 1. Appellants do not dispute (Reply Br. 3) that the AAPA scheme reduces dead times, but maintain that: "[a] prior art algorithm that reduces dead times without consideration of an ordering of the first and second time intervals can not be said to render the claims obvious."

These arguments are unavailing. The claims do not recite "a consideration of the ordering." AAPA Figure 4 shows that dead times are variable, but reduced in rows 1, 3-6, 7, and 8 between SF2 and SF3, for example, as compared to SF1 and SF2 in those same rows. (FF 3, 4.) Also, some rows in Figure 4 show dead times of only three, four, or five blocks, as compared to seven blocks in the scheme of Figure 3. Appellants state that this variable reduction "can be clearly observed" (FF 3).

In other words, since the AAPA of Figure 4 dead times vary, it follows that one set of dead times is reduced compared to another set. Claim 1 is broad enough to encompass the AAPA scheme of Figure 4 in which

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SF1, SF2, and SF3 (or just SF2 and SF3) represent "first and second time intervals in an order that reduces dead times between the time intervals." (The phrase "the time intervals" in the preceding clause may refer to the other "time intervals" initially introduced in claim 1 (i.e., time intervals besides the first and second).)[2]

Appellants do not point to any specific disclosure requiring dead times to be a function of any particular order. Despite Appellants' submission (App. Br. 16) that pages 7, lines 2-4 and page 9, lines 7-9 of their disclosure provide support for a specific "order" in claim 1 that distinguishes over any order implied in the AAPA algorithms, these cited sections do not support the submission. For example, page 7, line 3 of the Specification indicates that "the time intervals SF are not necessarily ordered."

In a related argument, Appellants argue (App. Br. 16-17) that the AAPA uses sequential ordering, but also argue that the claims do not preclude sequential ordering (Reply Br. 3). (*See* also Ans. 9-11 (addressing the sequential ordering).) Assuming for the sake of argument that non-sequential ordering minimizes dead times more efficiently than sequential ordering (*see* FF 3), as just noted, Appellants' arguments (Reply Br. 3) emphasize that the claims do not require non-sequential ordering. The Examiner reasoned (Ans. 10-11) that the AAPA MLA schemes produce a certain order, and whatever the order, that order results in reduced dead

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[2] Also, first and second time intervals do not preclude other time intervals. *See Innovad Inc. v. Microsoft Corp.*, 260 F.3d 1326, 1329, 1333 (Fed. Cir. 2001) (holding that a claim reciting "comprising" and a "single, bi-state switch" performing a certain function does not preclude other switches performing other functions and therefore reads on an apparatus having more than one bi-state switch).

times, as compared to another scheme. Appellants' arguments, disavowing any non-sequential ordering requirement in the claims, do not provide a convincing line of reasoning distinguishing the claims from the sequential ordering scheme of the AAPA.

In any case, the claims are not necessarily limited by any particular embodiment, *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) ("a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment"), or implied definitions, *Morris*, 127 F.3d at 1056 (quoted *supra* – indicating that absent an express definition in the Specification, the PTO can rely on other interpretations).

Appellants have not demonstrated Examiner error in the rejection of claims 1, 11, and 12, and claims 2-5, 9-10, and 13-14 not separately argued and falling therewith. Appellants' nominal arguments and reliance on the independent claims (App. Br. 21-22) also do not demonstrate error in the Examiner's findings pertaining to claims 6, 7, and 8, respectively rejected over the additional references to Rushing and Pooley. *See In re Nielson*, 816 F.2d 1567, 1572 (Fed. Cir. 1987); 37 C.F.R. § 41.37(c)(1)(vii).

"[W]hen . . . the prior art . . . is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *KSR*, 550 U.S. at 416 (citation omitted). This is not one of those "more difficult . . . cases" in which "the claimed subject matter . . . involve[s] more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement." *Id.* at 417. The Examiner's reliance on the AAPA schemes as producing frame orders in which dead times are

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minimized, amounts to a mere application of a known technique to Khormaei's familiar PWM scheme.

CONCLUSION

Appellants did not show that the Examiner erred in finding that Khormaei and the AAPA collectively teach time intervals, generating at least first and second non-zero emission levels of a light emitting element respectively during a first and second one of the time intervals, and generating the first and second time intervals in an order that reduces dead times between the time intervals, as required by independent claim 1.

DECISION

We affirm the Examiner's decision rejecting claims 1-14.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136. *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

KMF

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